

Remarks

In the present response, the specification and claims are amended. Claims 1-32 are presented for examination.

I. Specification Objections

The title is amended as suggested by the Examiner.

II. Claim Objections

Claims 5-12 are amended in a manner that is similar to the suggestion by the Examiner. Applicants respectfully request withdrawal of these rejections.

Claim 7 is amended as suggested by the Examiner. Applicants respectfully request withdrawal of this rejection.

Claims 14-27 are amended as suggested by the Examiner. Applicants respectfully request withdrawal of these rejections.

III. Claim Rejections: 35 USC § 102(e)

Claims 1-4, 6, 13-17, 19, and 26-33 are rejected under 35 USC § 102(e) as being anticipated by USPN 2005/0038968 (Iwamura). Applicants respectfully traverse this rejection.

A proper rejection of a claim under 35 U.S.C. § 102 requires that a single prior art reference disclose each element of the claim. See MPEP § 2131, also, *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983). Since Iwamura neither teaches nor suggests each element in the claims, these claims are allowable over Iwamura. Some examples for the independent claims are provided below.

Iwamura uses logs stored in a log storage area to perform a rollback for database recovery ([0257]). The logs and rollback are based on time: “Accordingly, when the database is recovered, the host 110 starts the recovery processing from the log at this time” ([0235]). Iwamura does mention an alternative embodiment wherein a sequential ID is used: “Here, the case of the ID has a feature that if a rule is set such that continuous numbers are previously assigned, a missing number can be recognized” ([0236]).

Iwamura does not teach or suggest using acknowledgements as part of his rollback process for database recovery.

Claim 1

By way of example, claim 1 recites “receiving acknowledgements from the second remote storage entity at both the primary storage entity and the first remote storage entity.” Iwamura does not teach that acknowledgements from the secondary sites (i.e., the sync site or async site) are sent to both the primary site and a secondary site. Further, claim 1 recites “comparing acknowledgements and sequence numbers in the first sidefile with acknowledgements and sequence numbers in the second sidefile.” As noted above, Iwamura uses logs based on time and mentions the use of continuous numbers as an alternative. Iwamura, though, never teaches or suggests comparing both acknowledgements and sequence numbers as recited in claim 1.

For at least these reasons, claim 1 and its dependent claims are allowable over Iwamura.

Claim 13

By way of example, claim 13 recites a primary storage entity to “forward acknowledgements from the second remote storage entity to the first remote storage entity.” Iwamura does not teach that acknowledgements from the async site are forwarded to the sync site. Further, claim 13 recites comparing both “acknowledgements and sequence numbers in the first and second sidefiles.” As noted above, Iwamura uses logs based on time and mentions the use of continuous numbers as an alternative. Iwamura, though, never teaches or suggests comparing both acknowledgements and sequence numbers as recited in claim 13.

For at least these reasons, claim 13 and its dependent claims are allowable over Iwamura.

Claims 28 and 29

By way of example, claims 28 and 29 recite maintaining a sidefile that includes “acknowledgements from the second remote storage entity received at both the primary

storage entity and the first remote storage entity.” Iwamura does not teach that acknowledgements from the secondary sites (i.e., the sync site or async site) are sent to both the primary site and a secondary site.

For at least these reasons, claims 28 and 29 and their dependent claims are allowable over Iwamura.

Claim 30

By way of example, claim 30 recites “comparing (1) the writes acknowledged to have been received and (2) sequence numbers assigned to the writes to determine data content at the second remote storage entity.” As noted above, Iwamura uses logs based on time and mentions the use of continuous numbers as an alternative. Iwamura, though, never teaches or suggests comparing both acknowledgements and sequence numbers as recited in claim 30.

For at least these reasons, claim 30 is allowable over Iwamura.

Claim 31

By way of example, claim 31 recites a processor that is operable to “receive indications of writes acknowledged to have been received at the second remote storage entity.” The claim then recites that the processor is operable to “assign sequence numbers to writes; and send the sequence numbers to the first and second remote storage entities.” As noted above, Iwamura uses logs based on time and mentions the use of continuous numbers as an alternative. Iwamura, though, never teaches or suggests the recitations of claim 31.

For at least these reasons, claim 31 is allowable over Iwamura.

Claim 32

By way of example, claim 32 recites that the first sidefile includes “acknowledgements from the second remote mirror means” Iwamura does not teach that acknowledgements from the secondary sites (i.e., the sync site or async site) are sent to both the primary site and a secondary site. Further, claim 32 recites that the first sidefile includes both sequence numbers and acknowledgements. The second sidefile also

includes sequence numbers. A comparison means compares the first and second sidefiles. As noted above, Iwamura uses logs based on time and mentions the use of continuous numbers as an alternative. Iwamura, though, never teaches or suggests comparing both acknowledgements and sequence numbers as recited in claim 32.

For at least these reasons, claim 32 is allowable over Iwamura.

IV. Claim Rejections: 35 USC § 103

Claims 5 and 18 are rejected under 35 USC § 103 as being unpatentable over Iwamura in view of USPN 6,912,483 (Frederick). As noted above in section III, Iwamura does not teach or suggest all the elements of independent claims 1 and 13. Frederick does not cure the deficiencies of Iwamura. For at least these reasons, claims 5 and 18 are allowable over Iwamura and Frederick.

V. Claim Rejections: 35 USC § 103

Claims 7-9 and 20-22 are rejected under 35 USC § 103 as being unpatentable over Iwamura in view of USPN 6,260,125 (McDowell). As noted above in section III, Iwamura does not teach or suggest all the elements of independent claims 1 and 13. McDowell does not cure the deficiencies of Iwamura. For at least these reasons, claims 7-9 and 20-22 are allowable over Iwamura and McDowell.

VI. Claim Rejections: 35 USC § 103

Claims 10-12 and 23-25 are rejected under 35 USC § 103 as being unpatentable over Iwamura in view of USPN 6,098,179 (Harter). As noted above in section III, Iwamura does not teach or suggest all the elements of independent claims 1 and 13. Harter does not cure the deficiencies of Iwamura. For at least these reasons, claims 10-12 and 23-25 are allowable over Iwamura and Harter.

CONCLUSION

In view of the above, Applicants believe that all pending claims are in condition for allowance. Allowance of these claims is respectfully requested.

Any inquiry regarding this Amendment and Response should be directed to Philip S. Lyren at Telephone No. 832-236-5529. In addition, all correspondence should continue to be directed to the following address:

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Respectfully submitted,

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